The Effectiveness of Using Realia Media and Video Media on Science Cognitive Learning Outcomes

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Abstrak

Proses pembelajaran di sekolah dasar ditemukan permasalahan bahwa kurangnya pemanfaatan media pembelajaran dan kurangnya ketertarikan siswa pada pelajaran IPA. Penelitian ini bertujuan guna menganalisis efektivitas penggunaan media realia dan media video terhadap hasil belajar kognitif IPA. Eksperimen digunakan sebagai jenis penelitian dengan pendekatan kuantitatif. Desain penelitian ini yakni korelatif. Populasi penelitian ini yaitu semua siswa kelas V, 15 siswa dipilih menggunakan teknik purposive sampling sebagai sampel. Pre-test dan post-test diberikan guna mengetahui hasil belajar kognitif. Data yang didapat diolah memakai paired sample t-test, karena data bersifat normal. Dalam penelian ini dapat disimpulkan bahwa penggunaan media realia lebih efektif diterapkan di pembelajaran IPA terhadap hasil belajar kognitif siswa dibandingkan dengan penggunaan media video. Bab ini ditunjukkan dengan perolehan nilai sig. 0,020 < 0,05, maka dari itu dinyatakan hipotesis awal diterima dan hipotesis alternatif ditolak.

Kata Kunci: Media Realia, Media Video, Hasil Belajar Kognitif, IPA

Abstract

The learning process in elementary school found a lack of use of learning media and a lack of student interest in science lessons. This study aims to analyze the effectiveness of realia and video media on science cognitive learning outcomes. Experiments are used as a type of research with a quantitative approach. The design of this research is correlative. The population of this study was all fifth-grade students. Fifteen students were selected using purposive sampling the sample. Pre-test and post-test were given to determine cognitive learning outcomes. The data obtained were processed using paired sample t-tests because the data were average. In this study, it can be concluded that the use of realia media is more effectively applied in science learning to students' cognitive learning outcomes than video media. The acquisition of sig indicates this chapter. $0.020 < 0.05$. Therefore, the initial hypothesis is accepted, and the alternative hypothesis is rejected.

Keywords: Realia Media, Video Media, Cognitive Learning Outcomes, Science

1. INTRODUCTION

Learning outcomes are changes in student abilities and behaviour achieved after the learning process, such as cognitive, affective, and psychomotor abilities. Learning outcomes are used as a reference in learning activities or the learning process. To state that a learning process can be successful, every educator has views (Darmadi, 2017; Novita et al., 2019). Learning outcomes are an assessment of each student's results in the cognitive, affective, and psychomotor domains. Of the three disciplines, the mental part is the most assessed by teachers in schools because it relates to the student's ability to master the content of the lesson material (Bauer & Booth, 2019; Berutu & Tambunan, 2018). Therefore, students are expected to be able to achieve learning outcomes according to predetermined standards, but in reality, many students are less than optimal in achieving learning outcomes. The use of learning media that is not optimal is a factor in the lack of achievement of learning outcomes. In line with this opinion, less-than-optimal learning media makes students bored and less motivated to learn (Windiyani, T. & Novita, 2018). Because basically, learning outcomes are the most critical part of learning (Oktaviana et al., 2018; Simsek & Can, 2020).

According to the results of observations at SD Negeri 1 Karanganom, it was proven that researchers found a lack of use of learning media in achieving learning objectives. When learning, teachers only use books, even though teachers should use various appropriate media. Therefore, students feel less attached to the learning material. The only source of learning is teachers and learning facilitators (Abduh, 2015; Silalahi & Hutauruk, 2020). Teachers must be more creative and innovative when realizing learning if they become learning facilitators. In addition, there was a problem that students felt less interested in science lessons because science was considered a complex subject. At the same time, science is one of the subjects taught in schools at all levels of education. Science is defined as things that stimulate increased curiosity, interest, and problem-solving, thus giving rise to thoughts and actions such as thinking, linking concepts and events, and observing (Novie Azizah et al., 2021; Siswono, 2017). Science learning should emphasize student-centred learning. Science learning in elementary schools aims to shape the child's personality so that children can improve their understanding of science concepts and knowledge and practice them in everyday life (Ardhani et al., 2021; Yeni, H. O. et al., 2020). Science learning should be carried out to cultivate thinking, work and science skills, and communication skills as essential factors in skills in understanding life (Pereira et al., 2020; Rahayu, 2019). When science learning takes place in class, students are less focused and tend to make noise. This is due to the innovative teacher in using learning methods and media.

The selection of media in line with the material is one of the ways for teachers to instil an understanding of the subject in their students (Nelva, Saputra, Hendra; Salim; Idhayani, Nurul; Kukuh, Prasetiyo, 2020). The importance of using learning media is also stated by a previous study that states using learning media can facilitate the student learning process and increase motivation and interest because students' curiosity and enthusiasm are very high (Al., 2020). Understanding media conveys messages, stimulates memories and emotions, and encourages students' willingness to learn (Ramdani, 2019; Reyna et al., 2017; Shalikhah, 2017). Learning media is an integral component of the learning system, meaning that the teaching press cannot be separated from the learning process because without learning media, the teaching and learning process cannot occur, and there are no excellent learning outcomes (Andriani, 2019; Qekaj-Thaqi & Thaqi, 2021). Not all media can be used during the learning process because the use of media needs to adjust the subject matter. Inappropriate selection of media can lead to less achievement of learning objectives. This agrees with the view of previous research that state media selection criteria need to adjust to the material, learning purposes, number of students, and facilities and infrastructure in schools (Arsyad, 2017).

Real media can be one of the alternatives used to create a classroom atmosphere that is conclusive and interesting, and not dull. As a result, students become active and enthusiastic about learning (Katoningsih et al., 2021; Munawaroh et al., 2021). Realia is a real object and is direct as a natural medium used in classroom learning. Realia media are all concrete media found in an area, whether they are needed in biological conditions or those that have been preserved (Andriyani & Suniasih, 2021; Febriani, 2017). Realia are objects and teaching aids used for learning from the world outside the classroom (Ibad & Sarifah, 2021; Sugiharti, 2018). The use of real media is not only done at the school but can also be done by inviting students to observe real objects directly in the natural environment. Therefore, realia media is a learning tool that can be used to motivate students to learn now from the original objects they know (Novie Azizah et al., 2021; Susilowati A et al., 2021). Meanwhile, according to a previous study, real media are real objects that can convey messages from the sender to the recipient and stimulate the power of thought, emotion, concern, and desire (Puspaardini et al., 2019; Sugiharti, 2018; Syukri & Yuniarni, 2017). Realia media is an influential media used in the learning process. Natural objects, living or

dead, and even imitation objects that represent the original are groups in realia media (Habibah, U., & Wardhani, 2019; Puspaardini et al., 2019).

Many previous studies have examined the effectiveness of using real media and video media on science learning outcomes. The first research found science learning outcomes can have a positive effect using video media (Ninawati & Wahyuni, 2021). Then the other researchers said that using learning video media can improve the learning outcomes of grade VI students of SD Negeri Lanbau 02 with magnetic material (Aliyyah et al., 2021). This is evidenced by before the cyclical or pre-cycle action students who achieved completeness only 13 out of 32 students with a percentage of 40.625%. Cycle I has achieved fullness for as many as 24 students with a rate of 75%. In the second cycle, 28 students with a percentage of 87.5%. That way, this study has met the success indicators set by the author of 80% (Busyaeri, A., Udin, T., & Zaenuddin, 2016; Munir, 2015). Furthermore, it is revealed that using realia media improved students' science learning outcomes. This was evidenced by the significance level of $p = 0.006$ (Setyaningsih et al., 2019). It is supported by research stating that there is an increase in students' science learning outcomes with realia media (Yulita, 2019).

Based on some of the research results above, it can be concluded that using media can improve student learning outcomes, especially in science subjects. This is because the use of media will involve students creatively in the learning process to develop students' thinking skills to increase student learning outcomes (Heo & Toomey, 2020; Joenaidy, 2019; Melinda, V et al., 2017). In some of the studies above, no research examines the effectiveness of realia media and video media on science cognitive learning outcomes. Therefore, researchers are interested in conducting this study to analyze the point of using realia and video media on science cognitive learning outcomes.

2. METHODS

A quantitative approach is used in this study. The quantitative approach is interpreted as research methods sourced from the philosophy of positivism, namely specific populations and samples that exist in research, data announcements with research instruments, and quantitative/statistical data analysis, aiming to test the established hypothesis (Sugiyono, 2019). The type of research is experimental. This study uses a correlative design. The comparison group and the experimental group were used in this study. The design overview of the research is presented in Figure 1.
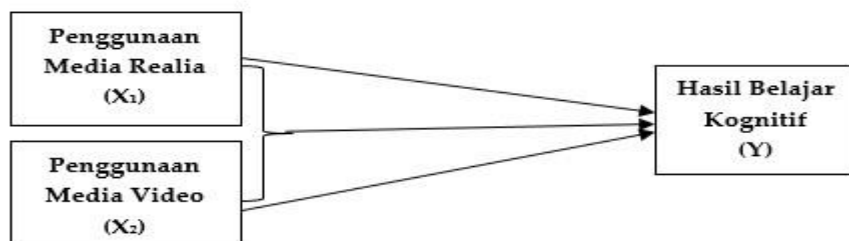

Figure 1. Research Design

The study used all fifth-grade students as the population. Fifteen students were selected as the research sample using non-probability sampling through the purposive sampling method, and the selection was chosen according to the research criteria. Data collection techniques used in this study were observation, interviews, tests, and documentation. Observations and interviews were conducted to discover the problems at SD Negeri 1 Karanganom. The research instrument in this test is objective questions, consisting

of 14 pre-test questions and 16 post-test questions. Before the research instrument was used, the items' validity, reliability, discrepancy, distractor functioning, and difficulty level were tested first. The test will be conducted before and after learning using realia and video media. While the documentation technique, the data was collected in the form of photos of research activities. Cognitive learning outcomes were tested using normality and homogeneity tests. If the data is normally distributed, then the hypothesis is tested by using the paired sample t-test.

3. RESULTS AND DISCUSSION

Result

The learning media is the most critical part of the learning process that contributes to the success of learning activities. The media is intended to clarify the information discussed. One of the benchmarks when proving the success of learning is the acquisition of students' cognitive learning outcomes. The application of appropriate learning media can influence students' cognitive learning outcomes. The study was conducted at SD Negeri 1 Karanganom to assess how realia and video media affect science cognitive learning outcomes. The subjects used are Natural Sciences (IPA), including material for animal movement organs.

In the cognitive domain of student learning outcomes, obtained through the pre-test and post-test results. The following is a table of data acquisition of pre-test and post-test learning outcomes that students have carried out. Results of pre-test and post-test scores are shown in Table 1.

Table 1. Results of Pre-test and Post-test Scores

Group		N	Range	Min	Max	Mean	Std. Deviation	Variance
Control	Pre-test	15	49	51	100	75.27	17.322	300.067
	Post-test	15	24	70	94	85.20	7.812	61.029
Experiment	Pre-test	15	28	72	100	85.53	9.709	94.267
	Post-test	15	24	76	100	90.80	7.476	55.886
Valid (listwise)		15						

Based on the data in Table 1 through the SPSS 26.0 application, it was found that the minimum score for the control class pre-test students was 51, the maximum score was 100, the average obtained was 75.27, and the variance was 300.067. Furthermore, for the experimental class pre-test, the minimum value obtained is 72, the maximum value is 100, the average obtained is 85.53, and the variance is 94,267. As for the post-test control class, the minimum score is 70, the maximum score is 94, the average obtained is 85.20, and the variance is 61.029. Furthermore, the minimum score for post-test students in the experimental class is 76, the maximum score is 100, the average obtained is 90.80, and the variance is 55.886. The acquisition of students' cognitive learning outcomes after being given learning using realia media and video media is higher than before using these media.

As a prerequisite test, it must be met before testing the hypothesis through paired sample t-test on research data through testing for normality and homogeneity. If the data is usually distributed with a significant value > 0.05, it is declared not generally distributed if the considerable value is < 0.05. For normality test is shown in Table 2.

Table 2. Tests of Normality

Class		Shapiro-Wilk		
		Statistic	**df**	**Sig.**
Science Cognitive Learning Outcomes	Pre-Test Control (Media Realia)	0.885	15	0.057
	Post-Test Control (Media Realia)	0.883	15	0.053
	Pre-Test Experiment (Media Video)	0.895	15	0.079
	Post-Test Experiment (Media Video)	0.890	15	0.068

Based on Table 2, the normality test using SPSS 26.0 with an alpha of 5% above obtained significant pre-test values for the control and experimental classes, namely 0.057 and 0.079. So the conclusion from the sample data obtained is usually distributed because the significance level is > 0.05. The same thing was also shown at the post-test significance level of the control class, 0.053 and 0.068 in the experimental category. It can be concluded from the pre-test, and post-test outputs that the sample data used are normally distributed. Furthermore, to fulfil the requirements, the homogeneity of variance test was carried out on a one-way ANOVA with the help of SPSS 26.0. Homogeneity test results are shown in Table 3.

Table 3. Test of Homogeneity of Variances

Statistic		Levene Statistic	df1	df2	Sig.
Science Cognitive Learning Outcomes	Based on Mean	0,074	1	28	0,788
	Based on Median	0,156	1	28	0,695
	Based on Median and with adjusted df	0,156	1	27,805	0,695
	Based on trimmed mean	0,109	1	28	0,744

The results of the homogeneity test of Table 3 were obtained to state that the post-test average value of the two classes is 0.788, at the level (Sig.) > 0.05. The conclusion from the post-test data of the control class and practical classes' post-test data has a similar variance, or the data is shown to be homogeneous. After fulfilling the prerequisite test, the researcher used a parametric test to test the hypothesis. Because the pre-test and post-test data from both classes proved to be normally distributed and homogeneous, the researchers used a parametric and paired sample t-test to test the hypothesis. Paired samples test is shown in Table 4.

Table 4. Paired Samples Test

Statistic		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	**Upper**			
Pair 1	Control Group	-9.933	14.680	3.790	-18.063	-1.804	-2.621	14	0.020
Pair 2	Experimental Group	-5.267	10.552	2.725	-11.110	0.577	-1.933	14	0.074

In Table 4 Pair 1 output, the results of the paired sample t-test using the SPSS 26.0 application show a significant value of 0.020 <0.05. As a result, the initial hypothesis (H0) is rejected, and the alternative idea (Ha) is accepted. So the conclusion is that there is a difference between the average pre-test and post-test of the control class (media realia). While the output Pair 2 obtained a significant value of 0.074 <0.05, therefore the initial hypothesis (H0) is accepted, and the alternative hypothesis (Ha) is rejected. In conclusion, there is no difference in students' average cognitive learning outcomes for the experimental class pre-test and post-test experimental class (video media).

Based on the analysis of the hypothesis, it is stated that there is a difference in the effectiveness of using realia media and video media on science cognitive learning outcomes. This chapter shows that the value (Sig.) obtained from the control class (media realia) is < 0.05, whereas the value (Sig.) obtained from the experimental type (media video) is > 0.05. Therefore, real media improves cognitive science learning outcomes more effectively than video media for fifth-grade students of SD Negeri 1 Karanganom.

Discussions

This discussion describes the results of data analysis, namely the normality test of the pre-test and post-test results, the homogeneity test, and paired sample t-test. As well as the instrument test data obtained after testing the validity, reliability, difficulty level, discriminatory power, and the functioning of the distractor, the researchers took 14 valid pre-test questions and 16 valid post-test questions. Based on the results of research at SD Negeri 1 Karanganom, both the control class and the experimental class, there were positive and significant differences in the use of realia media in the control class and video media in the experimental category. The pre-test of the practical course has an average value of 85.53 and 90.80 for the post-test. At the same time, the pre-test control class average value is 75.27, and the post-test is 85.20.

After testing the hypothesis, paired sample t-test was conducted to answer the first hypothesis, "Is there a significant difference in the use of realia media on science cognitive learning outcomes?". Then the results obtained by H0 are rejected, so the alternative hypothesis Ha is accepted. This case proves a difference in the use of realia media on cognitive science learning outcomes. It is shown that the t-count value is 2.621 with (Sig.) 0.020 <0.05, comparable to the decision criteria set. To answer the second hypothesis, "Is there a significant difference in the use of video media on science cognitive learning outcomes?". The results of the hypothesis test reveal that the pre-test and post-test scores have no difference in science cognitive learning outcomes using video media. The evidenced by the acquisition of a t-count value of 1.933 with a probability (Sig.) of 0.74, which means that the value (Sig.) obtained exceeds the predetermined (Sig.) value of 0.05. Then the alternative hypothesis (Ha) is rejected, and the initial idea (H0) is accepted.

With this, the study's results revealed that the use of real media was more effective than video media on science cognitive learning outcomes. The learning process is highly recommended with the help of natural objects because students better understand the material being studied. The advantages of realia media one of which is being able to share clear and accurate information. Realia media are natural objects used as learning media to facilitate learning by providing examples of actual media (Masnunah, 2018; Puspaardini et al., 2019). Realia media is widely used for learning as a tool to introduce new subjects by giving real meaning to things previously only described abstractly through words or visuals. The selected realia media is by the material to be taught to assist teachers in teaching and make students more interested in learning.

The benefits of realia media, according to a previous study, include: 1) being able to stimulate students' imaginations by bringing real-world life into the classroom, 2) being able

to assist in the process of finding information to gain knowledge through their own experience, 3) providing a direct and authentic experience, and experience of beauty that is not found in other media, 4) clarifying the presentation of messages not only in the form of written or spoken words (Gusmara, 2017). The characteristics of realia media are original objects that are still intact, operable, alive, in their actual size, and can be recognized as their original form (Ibad & Sarifah, 2021; Yulita, 2019). Teaching and learning activities can involve all students' senses through natural objects or objects. In addition, the advantage of realia media is that it can translate abstract ideas into real ones.

The use of real media is higher than the use of video media on science cognitive learning outcomes. This situation is due to using natural objects; students will learn more than just watching them from videos. Students become less active if they only watch videos because they do not interact directly with their learning objects (Lastari, 2018; Salsabila & Pradipta, 2021). Cognitive learning outcomes that have increased are not coincidental factors in each class but rather the treatment from each category. This is supported by determining factors such as the ability of educators, the use of learning media, the suitability of teaching materials, and the readiness of teachers to deliver material (Albro & Turner, 2019; Novita et al., 2019).

Furthermore, real media can share different learning experiences to make learning more meaningful. Meaningful learning explains that the outside world gives meaning to the learning process if only students can use concepts from the outside world to be turned into a content framework (Bressington et al., 2018; Chai & Kong, 2017; Clarke & Roche, 2018). With the use of learning media, especially science, in elementary school, students must learn meaningfully and concretely (Antara & Dewantara, 2022; Lastari, 2018).

Some researchers also reveal how the media can influence student learning activities, including research which shows that realia media can improve science learning outcomes in class IV heat transfer material. This is indicated by an average increase of 100% in the outstanding category (Algiranto; Yampap, Umar; Ruma, Bay, 2021). Other research reveals that teaching fourth-grade pupils at SDN 2 Pringsewu Timur about the components of the plant body's outward form and functions is improved using realia media (Setyaningsih et al., 2019). In addition, the study entitled "The Effect of Realia Media Use on Science Learning Outcomes of Class V Students" said that there was an effect of using realia media activities on the academic progress of SD Negeri 1 Way Kandis students in the fifth grade (Larassati et al., 2017). These various studies reveal that real media can be used as a reference by teachers during learning because it has several advantages.

The implication of this study provides an overview and understanding related to media realia which is very useful, especially for teachers who can be used as an alternative source of learning in schools to improve student learning outcomes. This research is still limited because it only involves one school as the research subject, namely SD Negeri 1 Karanganom. So it is hoped that future research will be able to deepen and broaden the scope of research related to the use of media realia.

4. CONCLUSION

Based on the data processing and hypothesis testing results, it can be concluded that using real media is more effective than video media in science learning material for animal movement organs in improving cognitive learning outcomes for fifth-grade students at SD Negeri 1 Karanganom. It is because real media can stimulate students' imaginations by bringing life in the real world into the classroom. Thus, realia media can be used as an alternative source of learning in schools to improve student learning outcomes.

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